

Toth et al.

S/N: 10/064,172

In the Claims

1. (Currently Amended) A pre-subject filter ~~having variable attenuation in two dimensions~~ for a radiographic imaging system, the filter comprising:

a first end having a first attenuation profile;

a second end having a second attenuation profile, the second attenuation profile being larger than the first attenuation profile; and

a body connecting the first end and the second end, the body having variable attenuation characteristics in at least two orthogonal cross-sections.

2. (Original) The filter of claim 1 wherein the first end further includes a filtering width narrower than a filtering width of the second end.

3. (Original) The filter of claim 1 wherein the body has an attenuation profile such that the attenuation power decreases continuously from the first end to the second end.

4. (Currently Amended) The filter of claim 1 having a U-shaped cross-section.

5. (Original) The filter of claim 1 being translated in at least one of a z-axis and a transverse axis of a CT system.

6. (Original) A CT system comprising:
rotatable gantry having an opening defining a scanning bay;
a movable table configured to translate a subject to be scanned along a first axis within the scanning bay;
an x-ray projection source configured to project x-rays projected toward the subject;

a pre-subject filter to filter x-rays projected toward the subject, the filter having a variable attenuation profile; and

a computer programmed to:

determine an attenuation pattern of the subject;

translate the filter along the first axis as a function of the attenuation pattern of the subject; and

acquire imaging data of the subject.

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7. (Original) The CT system of claim 6 wherein the computer is further programmed to translate the filter in a transverse direction as a function of the attenuation pattern of the subject.

8. (Original) The CT system of claim 7 wherein the computer is further programmed to position the filter as a function of the attenuation pattern of the subject to reduce radiation exposure to dose reduction regions of the subject.

9. (Original) The CT system of claim 8 wherein the dose reduction regions include anatomical regions sensitive to radiation.

10. (Original) The CT system of claim 6 wherein the computer is further programmed to determine the attenuation pattern of the subject from a set of patient projections.

11. (Original) The CT system of claim 6 wherein the computer is further programmed to move the filter as a function of gantry rotation.

12. (Currently Amended) A method of diagnostic imaging comprising the steps of:
positioning a subject to be scanned into a scanning bay;
projecting a radiation beam along a beam path toward the subject;
~~positioning a filter in the beam path, the filter having variable attenuation in the beam path~~
parallel to a subject's long axis;
~~translating the filter in at least one direction parallel to the subject's long axis to~~
reduce radiation exposure to sensitive anatomical regions of the subject;
acquiring imaging data of the subject; and
reconstructing an image of the subject from the imaging data.

13. (Original) The method of claim 12 wherein the filter includes:
a first end having a first attenuation profile;
a second end having a second attenuation profile, the second attenuation profile being greater than the first attenuation profile; and
a body connecting the first end and the second end.

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14. (Original) The method of claim 13 wherein the first end has a filtering width narrower than a filtering width of the second end.

15. (Original) The method of claim 13 wherein the body has a variable attenuation profile that varies continuously along a length of the body from the first end to the second end.

16. (Original) The method of claim 13 wherein the body has a width that tapers from the second end to the first end.

17. (Original) The method of claim 16 wherein the attenuation profile of the body varies non-linearly across any given constant width of the body.

18-20 (Cancelled)

21. (Currently Amended) A radiographic imaging system comprising:

_____ a scanning bay;

_____ a movable table configured to move a subject to be scanned fore and aft along a first direction within the scanning bay;

_____ an x-ray projection source configured to project x-rays in an x-ray beam toward the subject;

_____ a pair of cam filters formed of attenuating matter, wherein each cam filter has a length and an attenuation profile that varies as a function of filter length and wherein the attenuation profile of each filter is a function of filter thickness; and

_____ a computer programmed to:

_____ determine a region-of-interest of the subject;

_____ position the pair of cam filters to limit x-ray exposure outside the region-of-interest; and

The radiographic imaging system of claim 20 wherein the computer is further programmed to _____ translate at least one of the filters in the first direction to either increase _____ or decrease x-ray exposure to the region of interest.

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22. (Currently Amended) The radiographic imaging system of claim ~~18-21~~ wherein the pair of cam filters is oriented in an x-axis.

23. (Currently Amended) The radiographic imaging system of claim ~~18-21~~ wherein each cam filter has an elliptical shape.

24. (Currently Amended) The radiographic imaging system of claim ~~18-21~~ wherein the computer is further programmed to decrease a space between the pair of filters to narrow the x-ray beam and increase the space between the pair of filters to widen the x-ray beam.

25. (Currently Amended) A cam filter assembly for use with a radiation emitting imaging system, the cam filter assembly including a pair of ~~non-overlapping~~ cam filters wherein each cam filter has an attenuation power that varies with thickness of the filter, the pair of cam filters being configured to operate in tandem to manipulate a beam of radiation projected toward a subject to ~~limit radiation exposure to generate a desired radiation profile across~~ a region-of-interest of the subject.

26. (New) The cam filter assembly of claim 25 wherein each filter has a width situated along an x-axis and a length situated along a z-axis, the z-axis being parallel to a long axis of the subject, and wherein each filter has varying attenuation characteristics along its length.

27. (New) The cam filter assembly of claim 25 wherein each filter has a generally rod-shaped body.